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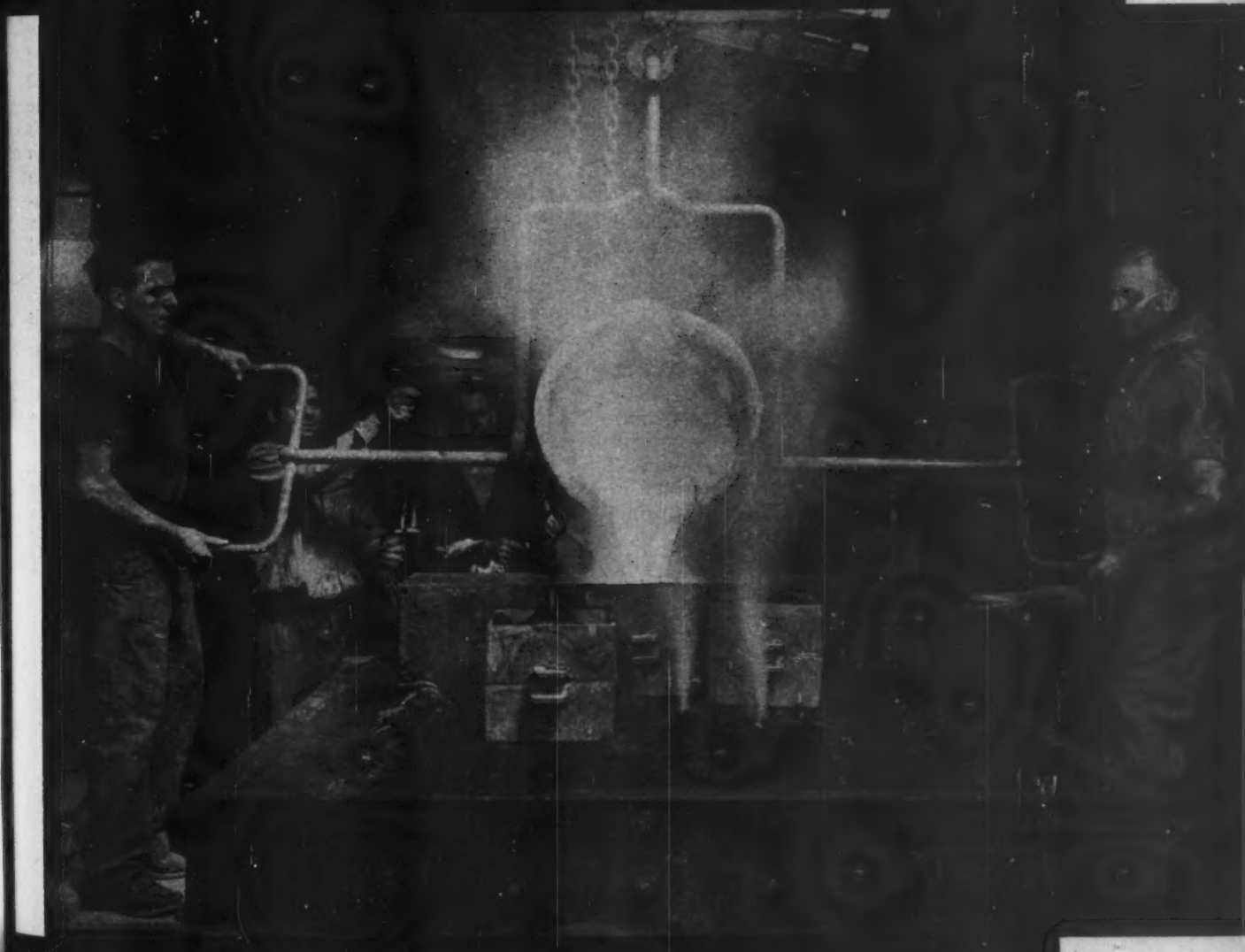
American Foundryman



August
1944

YOUTH FIGURES PROMINENTLY

In the Post-War Progress of the Foundry Industry

IN any situation involving the alternative of success or failure in industry, two factors of paramount importance are evident . . . namely, capable leadership and inspired workmen. The success of an industry depends upon its progress. To progress, an industry must have wise leaders to chart its course and able workmen who will produce the highest possible quality in its products.

The future of the cast metals industry in the post-war era and in the decades to follow, therefore, is dependent on both the leadership which the industry receives and upon the ability of its workmen. The immediate, post-war situation with regard to leadership and labor, however, presents less of a problem than will arise in the distant future.

Many men will return to our foundries from the armed forces to resume their former occupations and positions. These men, together with a portion of those already in the industry who have demonstrated their ability, will constitute the foundation on which the future of the industry will depend.

One of the most crucial problems which the cast metals industry faces at present is lack of competent manpower. This, although a product of the times, should be a warning to those engaged in the manufacture of metal castings. It should point out their obligation, as men who are proud of their foundry careers, to see that in the future their industry is supplied with capable leadership and manufacturing personnel.

All will agree that the youth of today is the "life blood" of our industry tomorrow. Experience of a large number of companies, through their difficulties in securing manpower and because of adverse publicity which the industry has received, shows that a concerted effort must be made by the foundry field to rectify these situations through increased interest in the industry by the general public.

To those of us who know the opportunities that are open to young men in the cast metals industry, and who are aware of the fascination, science, and art involved in the creation of a cast structure, will fall the decision. The youth of the country must be made to recognize the advantages that we know exist. Individually and collectively, it is our obligation to take an active part in this program. There must be a virtual crusade on the part of foundrymen toward creating public acceptance of the fact that *a progressive foundry is a clean, safe, and profitable place in which to work.*

Since many impressions of youth are carried forward to manhood, this effort should begin in the upper grades of elementary schools, continue through the formative years in high schools, and on through the collegiate studies. From those who finish high school and are not able to proceed with further education, and from those who may be denied even a full high school education, will come the potential workers and apprentices. From those who attend or graduate from engineering schools, will come both minor and major executives and control personnel.

Industry should have no qualms about embarking on such a program. As a large taxpayer, it pours thousands of dollars annually into the coffers of local and state governments for public education. Because this is true, it is entitled to a return on its investment in the educational structure of America.

The American Foundrymen's Association stands ready to promote and to cooperate in any plan which has for its objective a continuous and ample supply of both leaders and workmen for the foundry industry in the future.

Fred J. Walls

FRED J. WALLS, *Vice-President,*
American Foundrymen's Association.

FRED J. WALLS, International Nickel Co., New York, Manager of the Detroit Office, Development and Research Division, is Vice-President of the American Foundrymen's Association. Since completing his technical education at the University of Michigan, where he specialized in metallurgy, Mr. Walls has made the foundry industry his career. He has served on the A.F.A. Board of Directors for 3 years, 1939-42, and as a member on numerous committees of the Gray Iron Division, of which he is now General Chairman.

American Foundryman

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1944 REPORT
of Steel Division Committee
ON NON-DESTRUCTIVE TESTING

• This report shows the results of the work accomplished by the Committee on Magnetic Powder Testing and the Committee on Radiography, after the two were combined to form the Committee on Non-Destructive Testing, under the chairmanship of C. W. Briggs, Steel Founders Society of America, Cleveland.

DURING the past year (April, 1943, to April, 1944), the A.F.A. Steel Division Committees on Radiography and Magnetic Powder Testing were combined to form a single committee under the heading of a Committee on Non-Destructive Testing.

A number of steel foundries, which prior to this year have not used radiography or magnetic testing, are now constantly using non-destructive methods in the development or inspection of castings. The total number of steel foundries using non-destructive testing methods is not fully known. The committee took a letter vote on the question of ascertaining from the industry, by a questionnaire, the status of the use of non-destructive testing in the Steel Casting Industry. It was voted not to make such a survey during this past year as changes were being made so rapidly, particularly in the use of magnetic inspection, that a summary of the situation would be almost obsolete before it could be published. It is believed by the committee that the situation will be much more stabilized by the end of 1944, when the committee will decide on the feasibility of a survey similar to others made previously.

Use in Industrial Radiography

A brief and sketchy view of the Steel Casting Industry shows that five steel foundries have the million-volt x-ray unit, 15 additional foundries have industry x-ray units of varying voltage of smaller than the million-volt units. Eight foundries own radium for industrial radiography. Approximately 150 steel foundries have rented or leased radium for industrial radiography and, at the present time, there are over 75 steel foundries participating in yearly leases. Also, the U. S. Navy owns 17½ grams of radium for inspection of steel castings.

Thus it will be seen that over 50 per cent of all steel foundries in the United States have had experience with gamma ray or x-ray radiography for the study of casting technique and as an inspection method.

Magnetic testing also is being used by approximately 30 to 40 steel foundries. The interest in this field is great because of the U. S. Navy's requirements on the use of magnetic testing to supplement radiography.

Standards Unchanged

There has been no change during the year in the radiographic standards released in August, 1942, by the Bureau of Ships, Navy Department. Foundrymen generally have found them to be reasonable and they are agreeable to work with the standards as criteria of the degree of acceptability.

The Army Ordnance Department, during the past year, has established certain radiographic requirements for armor castings.

Committee E-7, American Society for Testing Materials, is still working on the development of radiographic standards. It is possible that they may adopt the new Navy Standards as A.S.T.M. Standards. Whether or not such action is taken is immaterial, in view of the fact that the Office of Price Administration of the Federal Government has adopted in its price order RPS41Amdt 11, March 4, 1944, a pricing arrangement for steel castings produced to Navy Department Bureau of Ships Radiographic Standards for Steel Castings, or similar standards. This action is tantamount to making the Navy Radiographic Standards universally known and used.

During the past year, A.S.T.M. Committee E-7 was responsible for the publication of a symposium on radiography. This symposium included several papers from the 1936 symposium, together with a number of others prepared in 1942. The book is excellent material for those entering the field of radiography.

In the Transactions of the A.F.A. vol. 50, June, 1943, the first report on magnetic powder testing appeared. The report contained a presentation of the fundamental principles and a clarification of the definitions of terms used in the field. The second report on magnetic testing appeared in the *American Foundryman* for September, 1943, consisting mainly of replies to a questionnaire sent to steel foundries on the attention and use given to magnetic testing.

During the past year, the Navy Department requested of valve and fitting manufacturers that magnetic testing be required on all flange parts of high pressure main steam line valves and fittings. Also, in September 1943, the Bureau of Ships requested that magnetic powder inspection be used in conjunction with radiography on main and intermediate shaft struts, rudder posts and rudder castings.

Bureau of Ships Conference

In November, a conference on magnetic powder inspection of steel hull castings was held at the Bureau of Ships, at which were representatives of foundries, Ship Yards and the Navy. These representatives commented at length upon their experiences with magnetic powder inspection. The total absence of any standard techniques or acceptability standards for interpreting the test was mentioned by many who took part in the discussion. It was decided to hold in abeyance any decisions regarding the establishing of specifications or standards until a sub-committee could collect information.

The subcommittee met at Steelton, Pa., in February, 1944, at which

time Messrs. J. F. Cotton and P. Ffield, Bethlehem Steel Company, and B. B. Burbank, Bath Iron Works, presented some factual information on magnetic testing.

The conclusions and recommendations drawn up by the subcommittee are as follows:

(a) A minimum degree of magnetization and direction of magnetization should be specified for the magnetic powder inspection of steel castings.

(b) Data should be collected on which to base a decision concerning the minimum degree of magnetization in time for the next meeting of the committee which is to be announced at a later date.

(c) Plans for hull castings should be marked to show the direction of principal stress and areas which should be subjected to magnetic powder inspection.

(d) Quantitative standards for acceptability of defects cannot be established at the present time and, therefore, all cracks and tears detected by magnetic powder inspection within the areas specified and which lie at an angle greater than 20 degrees to the line of principal stress should be excavated or repaired.

In line with the policy established last year of presenting in this report a review of only those articles the subject of which is related to the non-destructive testing of steel castings, articles are listed below as reference for those of the Steel Casting Industry who are interested in the non-destructive testing of steel castings.

Respectively submitted,

COMMITTEE ON NON-DESTRUCTIVE TESTING

C. W. Briggs, *Chairman*
R. A. Gezelius, *Vice Chairman*

T. N. Armstrong	J. W. Juppenlatz
J. J. Curran	G. A. Lillieqvist
J. A. Duma	E. W. Page
Werner Finster	W. J. Phillips
R. H. Frank	A. P. Spooner

H. F. Taylor

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4. *"Testing Wall Thickness of Intricate Castings,"* THE IRON AGE, Sept. 30, 1943, p. 58. A direct current method of testing the thickness of a casting wall from one side only. The potential drop caused by the flow of current is used to indicate the wall thickness.

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13. Van Horn, K. R., *"Recent Developments in X-ray Inspection,"* METAL PROGRESS, Jan., 1944, pp. 78-82.

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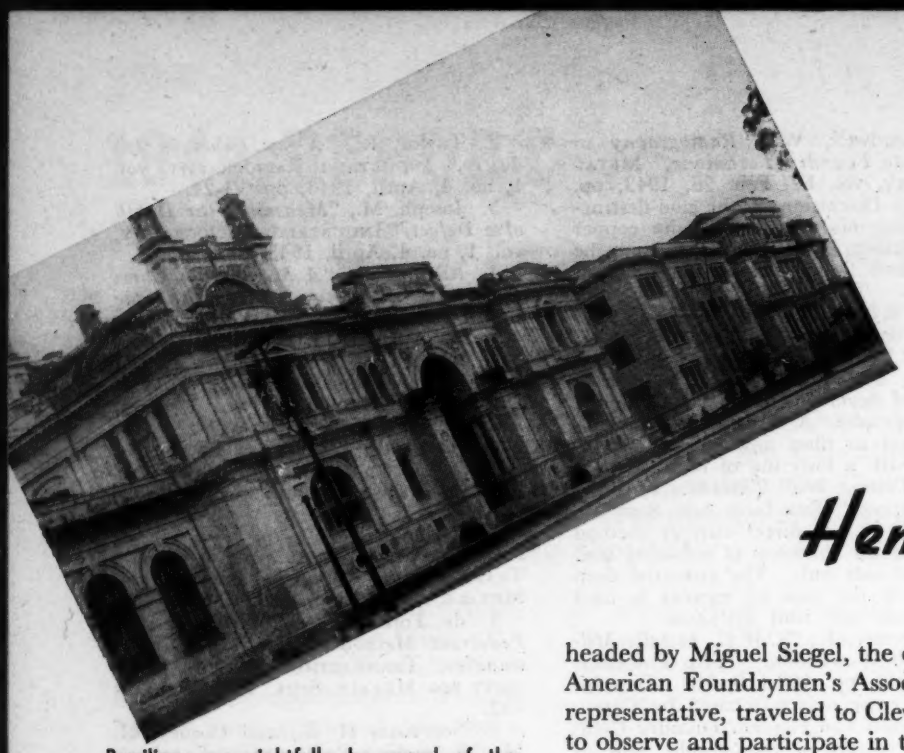
Marking another achievement for Caterpillar Tractor Co. and employees, presentation of the "S" Award for Safety was made at Tom Connor Field, Peoria, Ill. Left to right: H. S. Eberhard, Vice-President, "Caterpillar" and Master of Ceremonies, Safety Engineer H. S. Simpson, President L. B. Neumiller, and John M. Roche, Director Industrial Division National Safety Council.



BRAZIL

Benefits from Hemisphere Congress

Brazilians can rightfully be proud of the University of Sao Paulo. At the left is the Polytechnic School; the Institute for Technological Research is shown in the center; and at the extreme right is the Electrotechnical institute.

THE First Western Hemisphere Foundry Congress was held in conjunction with the 46th A.F.A. Convention and Foundry Show at Cleveland, April 20-24, 1942. It was a step toward furthering our Government's "good neighbor" policies and hemisphere solidarity, coupled with the foundry industry's effort to achieve unity and strength through an unwritten code of ideals and fraternity.

Brazil, our progressive South American neighbor, was aware of the benefits to be derived from such a scientific and industrial congress. Consequently, a Brazilian delegation, headed by Miguel Siegel, the official American Foundrymen's Association representative, traveled to Cleveland to observe and participate in the activities of an A.F.A. gathering.

As the invaluable technical sessions unfolded and these visitors heard the presentations and discussions of the latest developments in metallurgical science and foundry techniques, their appreciation of the motivating force behind the Association's activities was fully awakened; the impressive displays of the latest foundry equipment in the exhibition halls, by suggesting simplified methods of faster foundry production, aroused greater ambitions in the hearts of these representatives from a country that has a new-born conception of industrialization; finally, the practical value of the fellowship and cooperative spirit predominating among A.F.A. members demonstrated the true worth of an industrial brotherhood.

When the meeting was over, the delegation returned to Brazil to tell their countrymen of what they had seen and learned. Gradually the desire for unification of effort grew, as the industrialization of Brazil progressed, until a movement was started in Sao Paulo to organize the Brazilian Society for Metals.

The energy expended in this crusade bore fruit during the month of April, 1944, when an organization meeting was held under the sponsorship of an Executive Committee composed of Luiz Dumont Villares, Atlas Elevator Co., Sao Paulo; Jorge Souza Rezende, Maquinas Pira Ti Ninga Limitada, Sao Paulo, and Miguel Siegel, Foundry Department, Institute de Pesquisas Technologicas, Sao Paulo.

The Society plans to have an affiliated foundry group, so that foundrymen in the area may hold regular meetings for the discussion of foundry operations and problems.

Organization meeting held by the Brazilian Society for Metals, April 27-29, 1944.

NATIONAL DIRECTORS
at a 2-Day Annual Meeting
DRAFT FUTURE A.F.A. POLICIES

THE two-day Annual Meeting of the Board of Directors, held July 11-12 at the Palmer House in Chicago, was actually a merger of past activities and future projects on A.F.A. agenda. It was then that the 1943-44 board met with the 1944-45 group to review the previous progress of the Association and to formulate a course of action that will lead to increased A.F.A. development and greater service to the foundry industry.

L. C. Wilson, the retiring president, presided at the sessions held on the first day and, in turning over the gavel to R. J. Teetor, the new president, he completed a year of leadership that has set a record of achievement in A.F.A. history.

Record Membership

During 1943-44, under the chairmanship of R. J. Teetor, the Membership Committee reached an all-time high of 6620 members, as of June 30—the membership was 5665 a year ago, and two years ago it totaled 5047. This record of 1573 new members in two years is an accomplishment that reflects real credit on the untiring efforts of the Chapter Membership Committees.

In the two-year span, ending June 30, the Membership Committee reported 65 new Sustaining Members, 289 Company Members and 1215 Personal Members. These increases not only showed a growing recognition of A.F.A. service by foundry management, but it also reflected the increased desire on the part of operating men to avail themselves of information that will help them in their jobs.

Chapter Contacts

In view of the tremendous increase in A.F.A. members throughout the country, the necessity of maintaining closer relationship between the Chapters and the National Office was emphasized. Despite the difficulties, under present conditions, such activity was considered of major importance.

Accordingly, the Chapter Contact Committee of the Board was authorized to invite all Chapter Chairmen to a Chapter Contact Conference, to be held in Chicago, August 26. Invitations have now been extended to the Chairman of each of the 27 Chapters, and a constructive program will be presented that should go far in coordinating the work of the Chapters with the aims and policies of the National Association.

The Conference will be an all-day meeting at the Palmer House, and it is expected that many problems of direct interest to the Chapters will be clarified. It is also hoped that the Chapter Contact Conference will develop into an annual event of great importance to the entire Association membership.

The successful organization of three new chapters and one new chapter section, during the past year, was announced. Officers and directors of the new Texas, Rochester and Canton Chapters now are functioning with fine initial support, and the organization meeting of the new Saginaw Valley Section of the Detroit Chapter exceeded all expectations. The success of the Saginaw sub-group points the way for similar decentralization by other groups whose memberships likewise are scattered over large areas.

Special Reports

An Investigating Committee—composed of H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland; H. F. Taylor, Naval Research Laboratory, Washington, D. C.; and E. C. Troy, Dodge Steel Co., Philadelphia—was appointed to investigate the desirability of inaugurating a research project to study the transfer of heat within molds.

Their findings were presented to the Board by Director Max Kuniansky, as chairman of the Technical Activities Correlation Committee. The project was approved, and funds are to be provided for the first year's activity, which will probably be carried on at Columbus University, New York. Mr. Kuniansky was reappointed as Chairman of the Technical Activities Correlation Committee.

Oprating budgets for 1944-45 were submitted by the Finance Committee and approved, following the presentation of a statement which showed the sound financial condition of the Association. Serving on the Finance Committee are L. C. Wilson, Chairman, President R. J. Teetor, and Vice-President F. J. Walls.

"New Blood" for Industry

Considerable discussion developed on ways and means for maintaining a steady flow of "new blood" into the foundry industry, though stimulating the youth of the country toward adopting foundry work as a career. Vice-President F. J. Walls was appointed Chairman of a new Youth Encouragement Committee to advance this program, following successful efforts that he already has made along these lines.

Another new committee, which should be of assistance in interesting management in this and related projects, is a Management Committee, headed by Director S. V. Wood.

The creation of new records at the recent War Production Foundry Congress and Foundry Show, at Buffalo, was recorded in a report by C. E. Hoyt and W. W. Maloney. Over 6700 attended the Congress and some 244 exhibitors displayed their products, the largest number of exhibitors at any A.F.A. Foundry Show since 1930.

Consideration was given to the time and place for the 1945 and 1946 A.F.A. annual meetings, and the facilities of various cities were briefly reviewed. Selection of a city for both events is being held in abeyance, and the Executive Com-

mittee will arrive at a final decision in the near future.

A.F.A. Publications

Following the presentation of staff reports on A.F.A. publications, the Board approved a recommendation that the Pre-Convention Issue of the monthly AMERICAN FOUNDRYMAN be continued in 1945 on the same basis as the 1944 Issue. An extensive report on present and future policies with respect to the monthly magazine was submitted by Director R. C. Allen, Chairman of the AMERICAN FOUNDRYMAN Policy Committee.

Announcement was made that the following new publications have been made available for distribution during the past year: "Symposium on Magnesium Alloys," "Symposium on Malleable Melting Practice," "Code of Recommended Practices for Industrial Housekeeping and Sanitation," "Alloy Cast Irons Handbook," and "Recommended Practices for Non-Ferrous Alloys."

In addition, it is expected that the 1944 edition of the "Cast Metals Handbook" will become available for distribution shortly. All A.F.A. members are entitled to a gratis copy of this book on request, but with greatest possible emphasis being placed on its distribution to the engineers who design, specify, and purchase products utilizing cast metals.

Staff Officers Elected

The election of staff officers again placed Secretary R. E. Kennedy as the administrative head of the Association. Other staff officers were elected as follows: C. E. Hoyt, Treasurer; N. F. Hindle, Director, Technical Development Program; Jennie Reininga, Assistant Treasurer and Office Manager; and Wm. W. Maloney, Business Manager.

16 Directors Present

This 1944-45 meeting of the A.F.A. Board of Directors was geared to draft the policies of the Association to meet the requirements of an industry at war and to lay the groundwork for a stronger, more progressive post-war foundry field. Charting this course were leading figures in the industry, for A.F.A. directors are men of experience and broad future vision, including R. J. Allen, Worthington Pump & Machinery Corp., Harrison, N. J.; J. G. Coffman, Los Angeles Steel Casting Co., Los Angeles; J. E. Crown, U. S. Navy Yard, Washington, D. C.; Roy M. Jacobs, Standard Brass Works, Milwaukee, Wis.; Max Kuniansky, Lynchburg Foundry Co., Lynchburg, Va.; Vaughan Reid, City Pattern Foundry & Machine Co., Detroit; S. D. Russell, Phoenix Iron Works, Oakland, Calif.; R. T. Rycroft, Jewell Alloy & Malleable Co., Inc., Buffalo; H. S. Simpson, National Engineering Co., Chicago; Joseph Sully, Sully Brass Foundry, Ltd., Toronto, Ontario, Canada; Ralph J. Teetor, Cadillac Malleable Iron Co., Cadillac, Mich.; I. R. Wagner, Electric Steel Castings Co., Indianapolis; Wm. B. Wallis, Pittsburgh Lectromelt Furnace Corp., Pittsburgh; Fred J. Walls, International Nickel Co., Detroit; L. C. Wilson, Reading Steel Casting Div., American Chain & Cable Co., Inc., Reading, Pa.; and W. L. Woody, National Malleable & Steel Castings Co., Cleveland.

Also in attendance at the meeting was Brig. Gen. Thos. S. Hammond (I. N. G., Ret.), chief of the Chicago Ordnance District and past president of the American Foundrymen's Association.

M. J. GREGORY RETIRES

As Head of Caterpillar Foundry Div.

M. J. GREGORY has announced his retirement from the position of factory manager of the Foundry Div., Caterpillar Tractor Co., Peoria, Ill.

When Mr. Gregory joined the "Caterpillar" organization in January, 1929, it was with the unique assignment of not alone managing foundry operation but of creating a foundry from the ground up. He directed the planning of the "Caterpillar" foundry buildings, supervised their erection, specified the machinery with which the foundry should be equipped, and selected a group of key men to head the numerous sub-divisions of the operation.

Mr. Gregory, having worked his way up from an apprenticeship to a high place in the foundry industry, has always had a keen interest in the advancement of foundry knowledge and skills. He has long been a member of A.F.A. and very active in its affairs, having served as a member and chairman of some of the most important committees and as a director of the Association.

F. W. Shipley

M. J. Gregory

Frank W. Shipley, who has been named as successor to Mr. Gregory, has been a member of the "Caterpillar" organization since 1929.

Mr. Shipley is a graduate of Purdue University with a degree in chemical engineering. His foundry research work has benefited the foundry industry throughout the country, through the A.F.A., which he has served as chairman of important committees and as author of technical papers on various foundry subjects. At present, he is a director of the Quad-City Chapter.

CHANGES IN BRASS FURNACE

Cut Melting Time and Waste by Oxidation

• A previous article, by Thomas Henry, explained the redesign of a bronze melting furnace to secure ease of operation and maintenance. Additional alterations have resulted in reduced melting time and less waste by oxidation, as described in the accompanying article.

By THOMAS HENRY

Crouse-Hinds Co. of Canada, Ltd., Toronto, Ontario, Canada.

AN article appearing in the November, 1943, issue of AMERICAN FOUNDRYMAN described some changes made to bronze melting furnaces in the Crouse-Hinds foundry, which have been very satisfactory in operation.

Since then, two additional slight alterations also have proved to be very satisfactory, resulting in reduced melting time, and appreciably less waste by exidation without the use of glass or other oxide preventative.

Fig. 1 shows a plan and a cross section of the furnace, "A" representing the crucible in the usual position, and "B" a discarded crucible having the bottom cut off and the top trimmed level.

"C" is the regular furnace cover with the center hole cut to be one inch greater in diameter than the outside diameter of the crucible. "D" is a light cover of any refractory material.

Method of Operation

In operating, the following is the order of procedure: Crucible "A" is loaded with billets and placed on the pot rest in the furnace as usual. The cover "C" is swung to the closed position and crucible "B" is dropped into place with a pair of tongs, taking care that it is central with regard to crucible "A". Crucible "B" is then filled up with scrap, sprues, gates, etc., and the small cover "D" put in place.

As the metal in crucible "A" melts and sinks down, the scrap metal in crucible "B" follows it and, as it has by this time been heated to not far from the melting point, loss of time caused by adding cold metal is avoided.

If the total charge is weighed, it is possible to determine the exact amount of scrap to be put into crucible "B" in order to fill crucible "A" to the desired level.

If, however, due to the size and shape of the scrap it is not possible to get enough metal in at the first charge, it is very easy to add to same by removing the small cover "D" after the metal has settled down to some extent, and this is done without shutting off the heat and without the danger of splash or of dropping small pieces of scrap outside the crucible.

Reducing Waste

Waste by oxidation is considerably reduced because, if the joint between the upper and lower crucible is kept fairly good, and leakage under the small cover "D" is kept to a minimum, very little air and practically no direct flame reaches the metal.

The other change referred to is in the position of the burner nozzle, (burning gas in this case). The tangential position of the nozzle with respect to the wall of the furnace is the same as before, but instead of being horizontal, the nozzle is set to discharge at an angle of 8° above the horizontal, as shown in Fig. 1.

The result of this change is that the flame from the nozzle is started on an upward spiral without having to wait for the upward pull of natural draft. Consequently, when the partially burned gas has completed one circle around the crucible it passes above the nozzle and does not mix with the freshly ignited gas issuing therefrom, and so it does not retard combustion by diluting the mixture with CO_2, etc.

It can readily be seen that this advantage will be more apparent with a furnace of relatively small internal diameter, and using gas with high velocity at the nozzle, than would be the case with a furnace of larger diameter and lower air pressure and, therefore, lower gas or flame velocity.

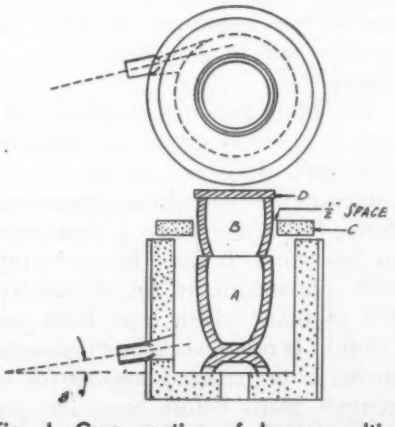


Fig. 1—Cross section of bronze melting furnace, showing alterations made to crucible and burner nozzle which is set at an angle of 8° from furnace wall.

Bound "Transactions" Ready for Distribution

VOLUME 51 "Transactions," including all the papers presented at the different sessions of the 47th Annual A.F.A. Meeting and 2nd War Production Congress, together with the complete discussions, is now ready for distribution.

Like the bound volumes of previous "Transactions," Number 51 has a durable red leatherette cover. The 1155-page book is available to A.F.A. members for $3.00.

Detroit Patternmakers Hold Bowling Contest

THE City Pattern Foundry & Machine Co. won the championship trophy in the recent bowling tournament sponsored by patternmakers of the Detroit area.

Of the 26 teams in the league, representing pattern shops throughout the district, the City Pattern Foundry & Machine Co. sponsored three teams. Members of the winning group are Adolph Mierzwa, Jay Law, Al Brunsinski, Joe Taleck and Ferd Wunsche.

GOVERNMENTAL PRINCIPLES
for Establishing an Incentive Program
Discussed at A.F.A. Congress

• This paper, which was presented at the Job Evaluation and Time Study session, April 27, 1944, at the 3d War Production Foundry Congress and 48th Annual Meeting of A.F.A., emphasizes the constructive effect that a well-operated incentive plan can have on industrial relations in a plant. It advocates harmonious unison between management and labor in maintaining maximum production schedules.

Presented by
J. W. NICKERSON
Director, Consultant Div.
War Production Board
Washington, D. C.

WARTIME wage incentive plans are accomplishing two objects vital to the war effort. They are increasing production and they are conserving manpower.

Considering whole regional areas and including all types of plans—good, bad and indifferent—they are averaging an increase in productive performance of 25 per cent to 40 per cent. Ninety-five per cent of the plans indicate gains of over 5 per cent, and some run from 100 to 150 per cent in specific installations.

Wage incentive plans applying to individual workers and based upon time study are resulting in increases in productivity over past performance, averaging over 60 per cent. In contract, all other types of plans including those based on past performance and those applying to departments and whole plants are averaging increases of somewhat less than 30 per cent.

Whenever productivity is increased, and particularly in critical areas, there is not only a beneficial effect on total production but upon the manpower problem. *Productivity may be considered production per man hour.* When you double productivity you may double production and remove the necessity for supplying the corresponding man hours, or else you may get the same production with the use of 50 per cent less man hours.

Increased Production

Although it is almost universally true that a wage incentive plan will increase production and save manpower, soon after it is installed, it is also unfortunately true that a carelessly conceived or poorly maintained plan is apt to bog down, cause bad labor relations and end in restricted production.

Thus, it is a fact that there are many plans all over the country which have been operating for years on an unscientific basis, with lack of proper management attention and accompanied by recurrent labor-management disputes. With these conditions cured and with the one-third added production per man hour, which we might expect if industries now on day work saw their way to change to incentives, we should go a long way toward solving our problems of critical areas and industrial deferment.

Need for Engineering Firms

At the present time the chief function of the Management Consultant Division of the W.P.B. is to assist managements to correct unsatisfactory wage incentive plans and to establish new ones. We have not the authority to dictate, no veto power; we only advise. We have had, during the past year, over 3,000 requests for assistance all over the country and in practically every industry.

The Management Consultant Division is a small group of industrial engineers. It is not in any sense a substitute for consulting engineering firms, for which there is great need in this work. It does, however, provide guidance as to the characteristics of plans which have been successful. It often works with managements in preparing proposals for incentive plans before they are presented to the war labor boards.

The regional boards and the national board often refer managements to us, either during consideration of a plan or when one is rejected, in order that it may be improved to meet the requirements of the board. We have rendered to the war labor boards, at their request, and in collaboration with the Office of Labor Production, about 1,300 reports as to the probable effect of plans upon production, wages and cost.

The National War Labor Board has stated that its consideration of wage incentive cases will be limited to voluntary submissions by employers, and to joint submissions agreed to by employers and unions in each situation in which a union is the collective bargaining agent of the employees. It will not order a wage incentive pay program in dispute cases, since that would be incompatible with the need for cooperation.

Assuming Responsibility

The War Labor Board, moreover, has stated that its action will be limited to a determination of whether or not the proposed wage incentive plan is in conformance with the national stabilization program. Those proposing a plan must assume full responsibility.

This was certainly a correct decision, placing as it does the initiation and design of such a program directly within the plant. In every plant the technical background and the management and labor relations are different. The whole subject varies as human consciousness varies, with time and locality.

It is, therefore, fortunate that no government board has put forward a definite formula specifying what constitutes a proper incentive plan.

With managements disagreeing, and radically, with each other and unions disagreeing with each other, as to the requisites of incentive plans and even as to their desirability, it would be preposterous for government agencies to attempt to frame a rigid plan to inflict upon American management and labor.

To be most successful a wage incentive plan should involve:

1. A foundation of properly evaluated basic wage rates.
2. A determination of the best methods of performing operations.
3. The establishment of fair time allowances as standards for their performance.
4. The determination of the most advantageous relationship between productivity and incentive wages.

16 Guiding Principles

The Management Consultant Division has issued a group of 16 guiding principles applicable to wage incentive plans, which I should like to discuss briefly with you.

1. A wage incentive plan releases forces acting on two of the most potent factors in labor relations, wages and effort expended. Therefore, in establishing such a plan, all available scientific and engineering ability should be used, combined with a sympathetic attitude toward the human relations involving personnel.

2. A wage incentive plan may be a dynamic and constructive force for increased production, or it may be a means of disrupting labor relations and actually lowering production. Therefore, management should realize that incentive plans must have the continued attention of top executives.

Informed Representatives

3. If a company's employees are represented by a recognized union, their representatives should be fully and continually informed regarding the methods and procedures used and the objectives to be accomplished. Management and the bargaining agency should be in real agreement as to the adoption or modification of the plan.

4. The plan should be sufficiently simple to be thoroughly understood by those to whom it is applied. Oversimplification, however, may involve injustices; attempts to meet every exigency, however, tend to overcomplicate. Workers should understand the effect of their own efforts on their earnings.

5. The plan should definitely increase production as well as wages.

6. There should be no appreciable increase in the unit labor cost of the operations performed by the workers to whom a plan is applied.

7. Production standards, where practicable, s h o u l d be developed from detailed time studies. Clear and definite standards eliminate future difficulty and misunderstanding.

8. In general, the production standard should be established by management as the amount of work performed per unit of time by a normal, qualified operator under normal conditions.

9. The plan should provide for the changing of production standards whenever changes in methods, material, equipment or other controlling conditions are made in the operations represented by the standards. In order to avoid misunderstandings the nature of such changes should be made clear to the union, which should have the opportunity to appeal through the grievance machinery.

Temporary Standards

10. The practice of setting a temporary standard in new plants or on new operations (because of the desires of both management and labor to have incentive work before the permanent standard can be set) should be kept to a minimum. It should in any event be clear to all that the standards are temporary and for a reasonably short period only.

11. Except for such changes as described in "9" and for temporary rates ("10"), production standards once established should not be altered except by mutual agreement between the company and the representatives of its employees.

When these representatives have sufficient confidence in the management to offer the correction of errors made by management in setting rates, and when they can convince the employees of the wisdom of this step in the interest of unrestricted production, this is an indication of advanced labor relations. Conversely, management should be willing to correct too severe rates.

12. Under o r d i n a r y circumstances, management should guarantee that the employees' basic hourly rates which existed prior to the plan should become guaranteed rates of pay under the plan.

13. When production standards are properly set as outlined in "7" and "8", good practice has demonstrated the desirability of adopting an incentive payment in which earnings above the established standard are in direct proportion to the increased production. That is, a 10 per cent increase in production over standard should call for 10 per cent increased pay over the base rate. This statement should not, however, be universally applied.

Unstable Increase

Often, in order to increase immediately critical production, managements and unions have agreed to use crudely estimated standards before production has been reasonably stabilized. If, in all such cases, payment above low standards was paid in direct proportion to production increase and not really accompanied by effort increases, i n s t a n c e s of doubled and trebled earnings would arise and plague both labor and managements.

Actual inflated increases would disturb intra-plant and intra-community wage levels. Potential increases might be more serious due to the tendency toward restricted production which would prevail. In order to guard against such a condition and still provide an incentive, managements and unions have often by agreement adopted a plan in which the reward of increased production is shared jointly.

Responsive Incentives

14. In ordinary times, and without the war motive, it is generally conceded that incentives applied to individuals and small groups are more responsive than those applied to large groups. When a plant is divided into a number of large groups on incentives, it often happens that feelings of injustice creep in and plant transfers are difficult to effect. This, of course, is not true of plant-wide incentives.

15. It is often considered desirable to include indirect workers in the incentive plan even when the measurement of their production is impracticable. If this is done and they are paid a bonus commensurate with the production of measured employees, the indirect man-hours

should in some way be correlated to some measurable unit, such as total so that indirect labor overhead costs may be kept under control.

16. Today we need immediate increase in war production. There are plants where it is impractical from the point of view of time to wait for scientifically established individual standards. In many such cases all-over plant incentives may be devised which will prove effective during the war.

Wage Incentive Plans

Although in peace time the dilution of the individual's effort might be so great as to indicate the probable ineffectiveness of this method, today it is essential to put every effort back of plant team-work. There are clear indications that, with enthusiastic support of management and labor, standards may be set for an entire plant based on actual production per man-hour and incentives paid to all employees as a proper reward for the extra effort and accomplishment.

There never was a time more favorable for the serious consideration of wage incentive plans, for a clear definition of a "fair day's work" and a "fair day's pay." In every plant, in every department, some individual or some group is deciding daily what the day's effort will be. Is it better that it be decided by tradition, by guess, by prejudice, by chance, by greed, by fear? Or, is it better that management and labor face the problem honestly and courageously and allow the most scientific, logical and common-sense solutions to prevail?

Government Support

Now is the time to set in order these deepest problems between labor and management. Fortunately, government is now wholeheartedly behind this effort. Production of war materials is critically needed. Manpower is vitally needed to support our economy and to fill the ranks in the greatest military effort of all time. Beyond all this in the days that are coming will be the necessity for industry to put its house in order; to base its decisions and actions on fact, instead of on opinion, so that it may survive in competition and rise to a new era of opportunity.

APPRENTICE GRADUATIONS

Held by Northern California Chapter

IN 1942 the Northern California Chapter appointed S. D. Russell, National A.F.A. Director, Phoenix Iron Works, Oakland, H. A. Bossi, H. C. Macaulay Foundry Co., Berkeley, F. A. Mainzer, Pacific Brass Foundry, San Francisco, and A. H. Homberger, General Metals Corp., Oakland, to serve on an Apprentice Training Committee.

Local 164, International Molders Union, joined in the movement which was designed to influence young men to turn to the foundry for a career, and appointed Frank Brown, Anthony Knobles, R. Buck and Carl Voges to the Committee.

William Logue, Federal Apprentice Training Service, assisted the group in an advisory capacity; Loren N. Stevens, apprentice coordinator of the Oakland Public Schools, provided classroom facilities in one of the evening trade schools, where the joint Committee conducted the course. J. L. Melling, a journeyman molder from the H. C. Macaulay Foundry Co., served as instructor.

For over two years these men held to their high purpose, despite frequent discouragement when promising members of the class were called to the Colors. However, they felt well repaid when the group of boys assembled for the commencement exercises on the evening of June 7, when three students graduated.

Mr. Russell, the committee chairman, in presenting the diplomas, which were furnished by the California State Apprentice Training Council, thanked his co-workers for their faithfulness, and asked those present to encourage other apprentices to attend and complete future courses. Those graduating were J. H. Hamburgh, H. C. Macaulay Foundry Co., Manuel Florence, Vulcan Foundry, and Harry Bush, California Foundries.

Photos courtesy S. D. Russell.

Members of the Northern California Chapter contributed considerable new working material to the apprentice training program, sponsored by the group. The pictures show the boys examining new equipment and exhibiting a sample of their work, while Instructor J. L. Melling and S. D. Russell (top, left photo) talk with the three graduates.

NEW ASSOCIATION MEMBERS

(June 16 to July 15, 1944)

• Comparison is always a positive check on progress, and it is interesting to compare the total number of new A.F.A. members this month with that of a year ago—101 in 1944 against 77 in 1943! Yes, A.F.A. is growing steadily stronger. Further evidence of this development is the number of conversions this month — 44 more Company members have just become Sustaining members of A.F.A.!

BIRMINGHAM CHAPTER

John B. DeWolf, Vice-Pres. in charge of sales, Woodward Iron Co., Birmingham.

CANTON DISTRICT CHAPTER

Louis A. Rowland, Sales Mgr., Louisville Fire Brick Works, Canton, Ohio.

CENTRAL INDIANA CHAPTER

Harold O. Bailey, Supt., Sonith Pattern Works, Indianapolis.
Eugene H. Smith, Supv., The Perfect Circle Co., New Castle, Ind.

CENTRAL NEW YORK CHAPTER

Stanley T. Dolan, Service Engr., E. F. Houghton & Co., Syracuse, N. Y.
Frank Riel, Fdry. Supt., Seneca Falls Machine Co., Seneca Falls, N. Y.
*Seneca Falls Machine Co., Seneca Falls.

CHICAGO CHAPTER

Oscar Blohm, Chief Met., Hills-McCanna Co., Chicago.
John T. Bryce, Met. Engr., Howard Foundry Co., Chicago.
Wm. E. Byrne, Chicago District Mgr., Abrasive Co., Chicago.
*Chicago Retort & Fire Brick Co., Chicago, Ill. (A. H. Taylor, Vice-Pres.).
*L. S. Cohen & Co., Chicago, Ill. (Harold A. Berger, Sales Rep.).
Arnold F. Eilenberger, Vice-Pres., Western Materials Co., Chicago.
V. M. Freymark, Engineer, Abrasive Co., Chicago.
*Greenlee Foundry Co., Chicago, Ill. (Chas. B. Magrath, Pres.).
*Wm. E. Pratt Mfg. Co., Joliet, Ill. (F. E. Clark, Pres.).
Edwill H. Pritchard, Salesman, Western Materials Co., Chicago.
F. G. Wheeler, Standards Engr., Miehle Printing Press & Mfg. Co., Chicago.

CINCINNATI DISTRICT CHAPTER

G. H. Beisley, Plant Supt., Ohio Stove Co., Portsmouth, Ohio.
Paul S. Brisker, Mounting Room Supt., Ohio Stove Co., Portsmouth.
W. K. Conley, Foreman, Wright Aeronautical Corp., Lockland, Ohio.
*Ohio Stove Co., Portsmouth (W. A. Burke, Pres.).
O. E. Ross, Gen. Mgr., Ohio Stove Co., Portsmouth.
*St. Marys Foundry Co., St. Marys, Ohio (Chas. E. Dine, Pres.).
Charles D. Steinmeier, Foundry Supt., A. D. Cook, Inc., Lawrenceburg, Ind.
Pearl Wells, Foundry Supv., Ohio Stove Co., Portsmouth.
John Wilburn, Cupola Supv., Ohio Stove Co., Portsmouth.

DETROIT CHAPTER

J. L. Jones, National Foundry Sand Co., Detroit.
*Michigan Malleable Iron Co., Detroit, Mich. (G. M. Harper, Treas.).
*Scott Valve Manufacturing Co., Detroit (Irvin C. Schoof, Foundry Supt.).
*United Metals Refining Co., Detroit (Philip Dubrinsky, Partner).
Richard S. Whittaker, Met., Detroit Diesel Engine Div. G. M. C., Detroit.
Max R. Wiard, Foundry Engr., Giffels & Vallet, Inc., Detroit.

DETROIT CHAPTER—SAGINAW VALLEY GROUP

Thomas Evans, Mgr., Sales, Baker-Perkins, Inc., Saginaw.
Edward H. Hak, Sub Foreman, Baker-Perkins, Inc., Saginaw.
W. G. Harbert, Sales Rep., E. F. Houghton & Co., Saginaw.
B. F. Hemstreet, Owner, Hemstreet Foundry, Saginaw.
Leonard T. Kalmes, Foundry Foreman, Baker-Perkins, Inc., Saginaw.
Edward M. O'Brien, General Foundry Foreman, Baker-Perkins, Inc., Saginaw.
Wm. Shillings, Foreman Core Room, Baker-Perkins, Inc., Saginaw.
*Valley Grey Iron Co., Saginaw (Robert W. Hesse, Mgr.).
Clarence R. Whalen, Chemist, Saginaw Malleable Iron Co., Saginaw.
Frank E. Young, Foundry Equipment Sales, Baker-Perkins, Inc., Saginaw.
Howard M. Zimmer, Foreman Cleaning Room, Baker-Perkins, Inc., Saginaw.

EASTERN CANADA & NEWFOUNDLAND CHAPTER

*Chamberlain Engineering (Canada) Ltd., Montreal, Que. (Jas. H. Newman, Mgr., Foundry Div.).
Harry Whitehead, Foundry Supt., Valleyfield Iron Works, Valleyfield, Que.

*Company Members.

METROPOLITAN CHAPTER

*Lithaloys Corp., New York City (Dr. H. Osborg, Vice-Pres. & Gen. Mgr.).
*Mechanite Metal Corp., New Rochelle, N. Y. (Oliver Smalley).
A. Muller, J. R. Wood Products Corp., New York City.
*Frank Roth Co., New York City (Frank Roth, Partner).
*J. R. Wood Products Corp., New York City (R. L. Wood, Pres.).

MICHIGAN CHAPTER

*Bendix Products Division, South Bend, Ind. (Geo. E. Stoll, Asst. Gen. Mgr.).
R. M. Fiandt, Research Chemical Engr., C. G. Conn, Ltd., Elkhart, Ind.
*Josam Products Foundry Co., Michigan City, Ind. (J. H. Miller, Supt.).
Eugene M. Peck, Weil-McLain Co., Michigan City, Ind.
*Swayne-Robinson & Co., Richmond, Ind. (C. K. Robinson, Vice-Pres. & Gen. Mgr.).

NORTHEASTERN OHIO CHAPTER

*Bowler Foundry Co., Cleveland, Ohio (J. B. Bruce, Pres.).
*Edwin S. Carman, Inc., Cleveland, Ohio (Edwin S. Carman, Pres.).
*The Cleveland Electric Illuminating Co., Cleveland (John Schneider).
*Kindt-Collins Co., Cleveland, Ohio (Ernest T. Kindt, Pres.).
*National Smelting Co., Cleveland, Ohio (Walter M. Weil, Pres.).
*Ohio Foundry Co., Cleveland, Ohio.
*Smith Facing & Supply Co., Cleveland, Ohio (F. Ray Fleig, Vice-Pres. & Mgr.).

NORTHERN CALIFORNIA CHAPTER

C. V. Allen, Shipping Clerk (Steel Foundry), Enterprise Engine & Foundry Co., San Francisco.
Frank Casanette, Core Room, San Francisco Iron Foundry, San Francisco.
B. A. Gardner, Foundry Foreman, Howard-Cooper Corp., Walla Walla, Wash.
R. E. Hahn, Tech. Sales & Service, Hercules Powder Co., San Francisco.
George E. Keley, Cleaning Room Foreman (Steel Foundry), Enterprise Engine & Foundry Co., San Francisco.
James E. Kopka, Rep., International Forwarding Co., Oakland, Calif.
Jesse A. Marshall, Cleaning Room Leaderman (Steel Foundry), Enterprise Engine & Foundry Co., San Francisco.
Gordon J. McKenzie, Asst. Foreman (Brass Foundry), Enterprise Engine & Foundry Co., San Francisco.
*Phoenix Iron Works Co., Oakland, Calif. (S. D. Russell, Pres.).
Kenneth J. Rush, Core Maker, Enterprise Engine & Foundry Co., San Francisco.
George D. White, Clerical Supv., Enterprise Engine & Foundry Co., San Francisco.
J. Stewart Williams, Mgr., California Scrap Iron Corp., San Francisco.
Ray A. Wilson, Plant Supt., Pacific Steel Casting Co., Berkeley, Calif.

NO. ILLINOIS AND SO. WISCONSIN CHAPTER

*Arcade Manufacturing Co., Freeport, Ill. (L. L. Munn).
Clyde L. Nelson, Fire Brick Engr., Mexico Refractories Co., Milwaukee, Wis.
*Sall Bros. Co., Rockford, Ill. (J. A. Sall, Pres.).
*Smith Oil & Refining Co., Rockford, Ill. (O. S. Smith, Vice-Pres.).

ONTARIO CHAPTER

John Stuart Dewar, Tech. Correspondent, Canadian National Carbon Co., Toronto, Ont.
Frank A. Forward, Professor of Metallurgy, University of British Columbia, Vancouver, B. C.

PHILADELPHIA CHAPTER

*H. W. Butterworth & Sons Co., Philadelphia, Pa. (John H. S. Spencer, Mgr.).
*Carbon Malleable Casting Co., Lancaster, Pa. (Paul M. Hufford, Sec'y.).
*Dick Bros., Inc., Reading, Pa. (Charles K. Dick, Pres. & Treas.).
*E. I. duPont de Nemours & Co., Wilmington, Del. (W. R. Heald, Mgr.).
*Stanley G. Flagg & Co., Inc., Phialdelphia, Pa. (D. A. Jones, Treas.).
*Hale Fire Pump Co., Conshohocken, Pa. (Wm. S. Thomas, Foundry Engr.).
*E. F. Houghton & Co., Philadelphia, Pa. (D. C. Miner, Adv. Mgr.).
*U. S. Pipe & Foundry Co., Burlington, N. J. (R. K. Haughton, Vice-Pres.).

QUAD-CITY CHAPTER

Richard B. Cain, Asst. Metallugist, Ordnance Steel Foundry Co., Bettendorf, Iowa.
***Davenport Machine & Foundry Co., Davenport, Iowa (Chas. F. Scherer, Vice-Pres. & Gen. Mgr.).**
H. F. Dietrich, Foreman, Ordnance Steel Foundry Co., Bettendorf.
E. S. Farber, Master Mechanic, Ordnance Steel Foundry Co., Bettendorf.
Gordon L. Graham, Foundry Inspector, Rock Island Arsenal, Rock Island, Ill.
***Iowa Malleable Iron Co., Fairfield, Iowa (W. V. Hughes, Pres.).**
Earl F. Kimes, Gen. Foreman, Foundry, John Deere Spreader Works, East Moline, Ill.
***Keokuk Electro-Metals Co., Keokuk, Iowa (G. L. Weissenburger, Pres.).**
Michael L. Phelan, Ind. Engr., Ordnance Steel Foundry Co., Bettendorf.
Irwin F. Rauch, Foreman, Ordnance Steel Foundry Co., Bettendorf.
Gilbert Roman, Core Dept. Foreman, Davenport Besler Corp., Davenport, Iowa.
Raymond L. Schwartz, Foreman, Pattern Making Dept., John Deere Spreader Works, East Moline, Ill.
Carl W. Simmons, Foundry Foreman, Davenport Besler Corp., Davenport.
Cornelius Slovak, Foreman, Ordnance Steel Foundry Co., Bettendorf.

ROCHESTER CHAPTER

***Gleason Works, Rochester, N. Y. (Lawrence C. Gleason, Fdry. Engr.).**
Benjamin Labunski, Group Leader, Ritter Co., Rochester, N. Y.

ST. LOUIS DISTRICT CHAPTER

H. A. Kibby, Chemical Eng., McQuay-Norris Mfg. Co., St. Louis.
***National Foundry & Machine Co., St. Louis, Mo. (Wm. L. Heckman, Pres.).**

SOUTHERN CALIFORNIA CHAPTER

Leslie W. Ball, Triplett & Barton, Inc., Burbank.
W. R. Magoffin, Co. Partner, Caswell & Co., Los Angeles.
***Martin Iron Works, Los Angeles (E. S. Todd, Foundry Supt.).**
Charles W. Phillips, Plant Mgr., Utility Electric Steel Foundry, Vernon, Calif.
***Reliance Regulator Corp., Alhambra, Calif. (Robert Gregg, Fdry. Mgr.).**
Dave West, Warman Steel Casting Co., Los Angeles.
Joe Zika, Warman Steel Casting Co., Los Angeles.

TWIN-CITY CHAPTER

August F. Carlson, Minneapolis-Moline Power Implement Co., Minneapolis.
L. A. Kepp, Pres. L. A. Kepp Contracting Co., Rochester, Minn.
Knute Knutson, Minneapolis-Moline Power Implement Co., Minneapolis.
Waldo L. E. Swenson, Minneapolis-Moline Power Implement Co., Minneapolis.
Alfred H. Trapp, Minneapolis-Moline Power Implement Co., Minneapolis.

WESTERN MICHIGAN CHAPTER

***Kuhlman Electric Co., Bay City, Mich. (Albert E. Rhoads, Exec. Vice-Pres. & Gen. Mgr.).**
***Lakey Foundry & Machine Co., Muskegon, Mich. (Geo. Spoelma, Sec'y.).**
***Pyle Pattern & Mfg. Co., Muskegon Heights, Mich. (Adam Pyle, Jr., Sec'y.).**
***Standard Pattern & Model Works, Muskegon Heights, Mich. (Clifford D. Anderson, Owner).**

WESTERN NEW YORK CHAPTER

***Metal & Alloy Specialties Co., Inc., Buffalo, N. Y. (T. S. Hemenway, Pres.).**
***Otis Elevator Co., Buffalo, N. Y. (W. E. Van Horn, Mgr.).**
Joseph W. Rosenhahn, Owner, Master Pattern Co., Buffalo.
Thomas H. Simpson, Buffalo.
Robert Somerville, Supt. of Pattern Shop, Pratt-Letchworth Co., Buffalo.

WISCONSIN CHAPTER

***Brillion Iron Works, Inc., Brillion, Wis. (R. D. Peters, Gen. Mgr.).**
William Danninger, Army Ordnance Inspection, Milwaukee.
E. D. Fahlberg, Grede Foundries, Inc., Milwaukee.
David E. Gilman, Staff Engr., J. I. Case Co., Racine, Wis.
***Kirsh Foundry, Inc., Beaver Dam, Wis. (H. L. Kirsh, Pres.).**
Norman Koch, Metallurgist, Grede Foundries, Inc., Milwaukee.
A. F. Lecnar, U. S. Navy Instructor, Milwaukee.
Albert Raskin, Res. Supt., Allis-Chambers Mfg. Co., Milwaukee.
Eugene Schneider, Supt., Grede Foundries, Inc., Milwaukee.
***Sterling Wheelbarrow Co., West Allis, Wis. (I. R. Smith, Pres.).**

OUTSIDE OF CHAPTER

***Clearfield Machine Co., Clearfield, Pa. (P. B. Reed, Pres.).**
Nick Covacevich, Owner, Nick Covacevich Foundry Supplies, Mexico City, D. F. Mexico.
Marc Gomree, Gen. Mgr., Services Publics SOKIMO, Belgian Congo, Africa.
Wm. H. Hainke, Owner, Hainke Foundry, Kensington, Kansas.
***Hobart Manufacturing Co., Troy, Ohio (W. H. Hartley, Factory Mgr.).**
A. G. E. Robiette, Chief Met., Birmingham Electric Furnaces, Ltd., Birmingham, 24, England.

Active A.F.A. Worker, Harry J. Deutsch, Dies

HARRY J. DEUTSCH, a member of the executive body of the A.F.A. Aluminum and Magnesium Committee, and secretary of the Detroit Chapter in 1938, died July 5. At the time of his death, Mr. Deutsch was works manager of the Fairfield-Bridgeport, Conn., plant of the Aluminum Co. of America.

Franklin Institute Awards Francis J. Clamer Medal

THE Francis J. Clamer Medal was established by the will of Francis J. Clamer, a practical metallurgist and founder of The Ajax Metal Co., Philadelphia. It is awarded at least every five years, under the auspices of The Franklin Institute, upon the recommendation and choice of candidates by the Science and Arts Committee of the Institute.

The first award of this medal was made recently to Walter Emil Ludwig Mathesius, president of the Geneva Steel Co., a U. S. Steel subsidiary. Dr. Mathesius was born in Hoerde, Germany, and graduated from the Institute of Technology, Berlin, Charlottenburg. He merited his degree of Doctor of Engineering in 1911, and since that time has devoted his entire career to metallurgical engineering.

Dr. Walter Mathesius

Second White Star Award For Whiting Employees

EMPLOYEES of the Whiting Corporation won the Army-Navy "E" Award in March, 1943, for meritorious service on the production front. In November, 1943, the award was renewed by authorizing the addition of a white star. A second star was won in June, 1944.

A.F.A. Book Endorsed By Non-Ferrous Society

THE new A.F.A. book, "Recommended Practices for the Sand Casting of Non-Ferrous Alloys," has been endorsed by the Non-Ferrous Founders' Society.

Upon the recommendation of the Board of Directors, after reviewing the work, the Society has suggested that members add a copy of the book to their technical libraries.

CHAPTER OFFICERS

Leighton Long
Leighton M. Long & Associates,
Toledo
Chairman
Toledo Chapter

A. S. Klopf
Firegan Sales Co.,
Chicago
Chairman
Chicago Chapter

E. Eugene Ballard
National Bearing Metals Co.,
St. Louis
Chairman
St. Louis Chapter

R. E. Wilke
Deere & Co.,
Moline, Ill.
Chairman
Quad City Chapter

Wm. A. Rongering
Cincinnati Milling Machine Co.,
Cincinnati
Chairman
Cincinnati Chapter

R. G. McElwee
Vanadium Corp of America,
Detroit
Chairman
Detroit Chapter

V. C. Bruce
Buckeye Products Co.,
Elkhart, Ind.
Chairman
Michiana Chapter

Harry E. Ladwig
Allis-Chalmers Mfg. Co.,
Milwaukee, Wis.
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Wisconsin Chapter

Robert Bernard
La Cie J. A. Gosselin Ltee,
Drummondvilld, P. Q.
Chairman
Eastern Canada and
Newfoundland Chapter

R. W. Mattison
Mattison Machine Works,
Rockford, Ill.
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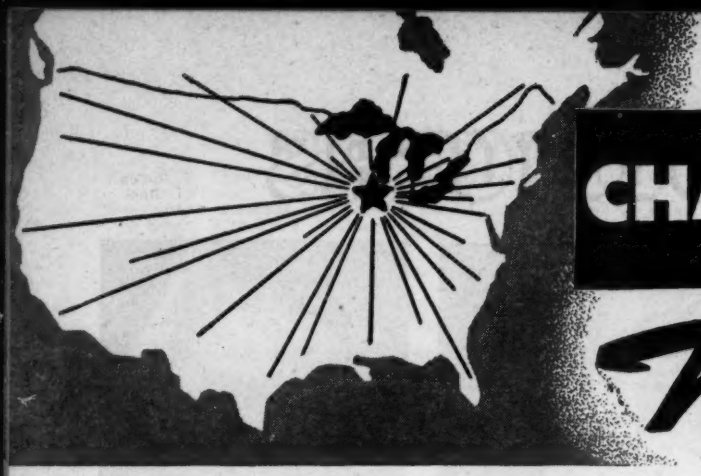
Northern Illinois-Southern
Wisconsin Chapter

R. D. Loesch
Lake Erie Foundry Co.,
Buffalo
Chairman
Western New York Chapter

Charles Morrison
Saginaw Malleable Iron Div.
General Motors Corp.,
Saginaw, Mich.
Chairman
Saginaw Valley Section of
Detroit Chapter



CHAPTER ACTIVITIES

News

See page 18 for list of Chapter representatives whose reports of local activities appear in this issue.

E. CANADA AND NEWFOUNDLAND

Sponsors First Maritimes Conference

By A. E. Cartwright

THE first regional conference organized by the Eastern Canada and Newfoundland Chapter was held at New Glasgow, Nova Scotia, May 11-12. A Maritimes Conference was conceived because of the number of foundries in the Maritime Provinces, particularly New Brunswick and Nova Scotia, and a desire on the part of the chapter to share the benefits of A.F.A. in greater degree with Maritime members.

The Montreal committee, headed by W. J. Brown, R. W. Bartram Co., Ltd., Montreal, and a Maritimes Committee under H. Scott Cameron, Maritime Steel & Foundries, Ltd., New Glasgow, did the work of planning and arranging for living accommodations and meeting rooms.

A total registration of 80 took part in the proceedings, with eight A.F.A. chapters being represented. A valuable contribution to the success of the conference was the presence of Joseph Sully, Sully Brass Foundry, Ltd., Toronto, Ontario Chapter and newly elected National Director.

H. J. Roast, Canadian Bronze Co., Ltd., Montreal, and past National Director, contributed a talk on "Honesty in the Foundry Business" at an opening meeting.

Technical sessions began the afternoon of May 11, with a welcoming speech by Mr. Cameron and a greeting to all members by R. W. Bartram, Robert W. Bartram, Ltd., Honorary Chapter Chairman. Mr. Bartram introduced G. Ewing Tait, Dominion Engineering Works, Ltd., Lachine, Que., who acted as chairman of the conference.

The first lecture was "Sands and Sand Mixing" by Henry Louette, Warden King, Ltd., Montreal. This was illustrated by a demonstration of a complete set of sand testing apparatus, loaned for the occasion by the Montreal Technical School. Mr. Louette used Dietert's "Defect Chart" as the basis for his lecture-demonstration and described how defective castings were eliminated or reduced to a minimum in his foundry by systematic application of sand control.

Following the sand session, F. G. Sefing, International Nickel Co., Inc., New York, gave a lecture on the subject of "Effective Methods of Producing Sound Castings." With the aid of lantern slides, Mr. Sefing presented a clear and logical review of the basic principles of securing sound castings in any and all types of alloys. The systematic application of the principle of controlled directional solidification and the methods for ensuring this condition formed the core of the lecture.

At the evening session Joseph Nixon, Whitehead Metal Co., Buffalo, followed up Mr. Sefing's talk with a detailed discourse on "Producing Sound Castings" through application of the fundamentals described at the preceding meeting. Numerous slides, some in full color, served to illustrate phases of Mr. Nixon's talk, and many examples of skim gating into risers, horn gating, and use of William's atmospheric blind riser were shown.

The Friday morning session was devoted to Melting Practice. A. M.

Technical sessions were coupled with less serious moments at the group luncheons and closing dinner, featured at the maritimes conference.

Eight A.F.A. Chapters were represented at the Eastern Canada and Newfoundland Chapter's Maritimes Conference.

Schwartz, Lunenburg Foundry Co., and Mayor of Lunenburg, served as technical chairman for this session. The first talk, "Melting of Bronze for Castings," by A. E. Cartwright, The Robert Mitchell Co., Ltd., Montreal, dealt with the choice of types of charges and their advantages and disadvantages.

Four general types were mentioned: ingot alloys purchased to specified analysis; calculated combinations of scrap metals purchased from scrap dealers; virgin metals; and base metal plus hardener. It was pointed out that the use of certified ingot alloys was most fool-proof and represented the surest means of repeatedly producing accurate analysis, especially for foundries without laboratory control.

Following the non-ferrous paper came one on "Control in Cupola Melting Gray Iron" by G. Ewing Tait. This contribution emphasized that, while the design of cupolas today is basically the same as nineteenth century models, improved operation comes through auxiliary equipment and correct operating procedures.

These improvements, said the speaker, have raised the quality and uniformity of the product so that the cupola may be regarded as a thoroughly reliable melting medium in its field. A comprehensive discussion of the control of variables, raw materials and the cupola blast was included in the talk. Mr. Tait advocated standardization of each phase of cupola operation and emphasized the value of metallurgical control in cupola melting.

The afternoon of May 12 was devoted to three round table metings —non-ferrous, gray iron and steel. Joseph Sully acted as chairman of the non-ferrous group, with H. J. Roast, A. E. Cartwright, G. E. Tait and A. M. Schwartz the discussion leaders.

C. V. Hacker, Hull Iron and Steel Foundries, Hull, P. Q., led the steel session, assisted by Emile Drolet, La Cie F. X. Drolet, Ltee., Quebec, P. P. S. Chapman, Canadian Car & Foundry Co., Ltd., Montreal, R. Scott, Canadian Car & Foundry Co., Ltd., Montreal, and A. G. Fraser, Maritime Steel & Foundries, Ltd., New Glasgow.

George Turnbull, Canadian Car & Foundry Co., Ltd., was the chairman of the cast iron group, with George Beaton, Dominion Steel & Coal Corp., Sidney, N. S.; Joseph Nixon and C. I. Mills, Record Stove & Furnace Co., Ltd., Moncton, N. B., serving as discussion leaders.

The closing dinner was a successful culmination of the two-day conference. Pat Dwyer, *The Foundry*, the principal speaker of the event, gave a talk on his popular subject, "Gates and Risers."

Annual Elections at Western New York

By J. Ralph Turner

JUNE 17 was the date set by the Western New York Chapter for its annual meeting, and Hotel Buffalo was the meeting place.

The principal event was the election of officers, so as soon as all additions were made to the original slate, presented by the nominating committee, balloting got under way. The winning candidates were:

Chairman—R. D. Loesch, Lake Erie Foundry Co., Buffalo.

Vice-Chairman—A. H. Suckow, Symington-Gould Corp., Depew, New York.

Secretary—J. Ralph Turner, Queen City Sand & Supply Co., Buffalo.

Treasurer—M. W. Pohlman, Pohlman Foundry Co., Inc., Buffalo.

DIRECTORS

F. E. Bates (1 yr.), Worthington Pump & Machinery Corp., Buffalo.

M. S. Finley (3 yrs.), The Werner G. Smith Co., Buffalo.

H. R. King (3 yrs.), Metal & Alloy Specialties Co., Buffalo.

H. J. Struebing (3 yrs.), Electro Refractories & Alloy Corp., Buffalo.

The presentation of a pin, an A.F.A. insignia set with a diamond, to Frank Bates, the retiring president, established a precedent for the group, for all past and future presidents of the group will receive a similar token of appreciation.

No. California Elects Officers and Directors

By Richard Vosbrink

CHAPTER Chairman Harry A. Bossi, H. C. Macaulay Foundry Co., Berkeley, presided at the Northern California Chapter's Ladies' Night and Annual Meeting, held June 9 at the Claremont Hotel, Berkeley.

Prior to the social activities, the election of officers was held, with the following results:

President—R. C. Noah, San Francisco Iron Foundry, San Francisco.

Vice-President—A. J. Snow, Snow & Galgiani, San Francisco.

Secretary-Treasurer — Geo. L. Kennard, Northern California Foundrymen's Institute, San Francisco.

Directors for a Two-Year Term

H. A. Bossi, H. C. Macaulay Foundry Co., Berkeley.

J. B. Bubb, Joshua Hendy Iron Works, Sunnyvale.

William Leishman, Pacific Brass Foundry, San Francisco.

A. M. Ondreyco, Vulcan Foundry Co., Oakland.

Ontario Group Elects Leaders for 1944-45

By G. L. White

RECENT voting made Robert Robertson, International Harvester Co. of Canada, Ltd., Hamilton, Ont., the new chairman for the Ontario Chapter. Other officers are: T. D. Barnes, Roseland Survey, Port Nelson, Ont., *Vice-Chairman;* C. C. MacDonald, Frederic B. Stevens of Canada, Ltd., Toronto, Ont., *Immediate Past Chairman;* and G. L. White, Westman Publications, Ltd., Toronto, *Secretary.*

Nine members will serve on the board of directors: W. J. Brill, Canadian General Electric Co., Ltd., Toronto; J. Dalby, Canada Metal Co., Ltd., Toronto; G. O. Loach, Otis-Fensom Elevator Co., Ltd., Hamilton, Ont.; L. B. Morris, Gurney Foundry Co., Ltd., Toronto; W. W. Nobbs, Clare Bros. & Co., Ltd., Preston, Ont.; T. Tafel, Standard Sanitary & Dominion Radiator, Ltd., Toronto; C. O. Williamson, Grinnell

Co. of Canada, Ltd., Toronto; R. A. Woods, Geo. F. Pettinos (Canada) Ltd., Hamilton, Ont., and J. A. Wotherspoon, Anthes-Imperial, Ltd., St. Catharines, Ont.

Michiana Announces Result of Elections

By V. C. Bruce

AS a result of recent voting by the members of the Michiana Chapter the following men were elected to office: V. C. Bruce, Buckeye Products Co., Elkhart, Ind., *Chairman;* W. V. Johnson, Oliver Farm Equipment Co., South Bend, Ind., *Vice-Chairman;* V. S. Spears, American Foundry Equipment Co., Mishawaka, Ind., *Secretary-Treasurer.* Also elected were five new directors: Earl Byers, Sibley Machine & Foundry Co., South Bend, Ind.; M. J. Lefler, Strom Brass Foundry, Elkhart, Ind.; J. C. Manning, Clark Equipment Co., Buchanan, Mich.; K. A. Nelson, Chicago Hardware Foundry Co., Elkhart, Ind.; and H. B. Voorhees, Dodge Mfg. Corp., Mishawaka, Ind.

Three Texas Officers Reelected by Chapter

By H. L. Wren

THE final meeting of its first season was held by the Texas Chapter on June 23 at the Golfcrest Country Club, Houston. It was at this meeting that members had an opportunity to vote for officers and directors to serve during the 1944-45 term.

F. M. Wittlinger, Texas Electric Steel Casting Corp., Houston; J. O. Klein, Texas Foundries, Inc., Lufkin, and H. L. Wren, Beaumont Cement Sales Co., Beaumont, the officers who served since the chapter was organized late in the 1943-44 season, were reelected. They will be assisted this term by a new board of directors, chosen by members of the old board, who served as the nominating committee. The new directors are: Robert Lang, Lufkin Foundry & Machine Co., Lufkin; W. E. Hockmuth, Houston Foundry & Machine Co., Houston; W. J. Temple, Kincaid-Osborn Electric Steel Co., Inc., San Antonio, and Phil Hawkins, Texas Steel Co., Fort Worth.

Frank Bates, retiring Chairman of Western New York Chapter, gives gavel to his successor, R. D. Loesch.

(Photo courtesy A. J. Heysel, E. J. Woodison Co.)

Sixteen Members Serve On Cincinnati Board

WHEN the Cincinnati District Chapter elected new officers and directors for the 1944-45 season, the board was increased to 16 members. These include:

Chairman—Wm. A. Rengering, Cincinnati Milling Machine Co., Cincinnati.

Vice-Chairman (3 yrs.)—A. W. Schneble, The Advance Foundry Co., Dayton.

Secretary (2 yrs.)—Jos. S. Schumacher, Hill & Griffith Co., Cincinnati.

Treasurer—W. J. Love, Jr., Lunkenheimer Co., Cincinnati.

DIRECTORS

To Serve One Year

William Beiser, Reliance Foundry Co., Cincinnati.

William Gilbert, Jr., Buckeye Foundry Co., Cincinnati.

Arthur Kuhn, Reliable Pattern & Castings Co., Cincinnati.

To Serve Two Years

W. J. Buvinger, Buckeye Foundry Co., Cincinnati.

Chas. E. Dine, St. Mary's Foundry Co., St. Marys, Ohio.

Chas. E. Koehler, Hamilton Brass & Aluminum Castings Co., Hamilton, Ohio.

Geo. S. Twachtman, Chris Erhart Foundry & Machine Co., Cincinnati.

To Serve Three Years

Arthur Alfers, Oakley Pattern & Foundry Co., Cincinnati.

R. G. Ebersole, Miller & Co., Cincinnati.

L. D. Fahey, Dayton Castings Co., Dayton.

S. F. Levy, Black-Clawson Co., Hamilton, Ohio.

H. F. McVay, Delhi Foundry Sand Co., Cincinnati.

No. Ill.-So. Wis. Elects New Officers

By B. L. Baptist

THE destinies of the Northern Illinois-Southern Wisconsin Chapter will be guided during 1944-45 by R. W. Mattison, Mattison Machine Works, Rockford, Ill., *Chairman.*

Mr. Mattison will be assisted by: John Cochran, Sundstrand Machine Tool Co., Rockford, *Vice-Chairman;* Howard Miner, Fairbanks, Morse & Co., Beloit, Wis., *Secretary;* and Glen Smith, Mattison Machine Works, Rockford, Ill., *Treasurer.*

Six new directors will also be on the board, including: Gunnard Anderson, Davey Pump Corp., Rockford; Ray Baysinger, Geo. D. Roper Corp., Rockford; Emmett John, National Sewing Machine Co., Belvidere, Ill.; Lyle Fulton, Geo. D. Roper Corp., Rockford; R. J. Looze, Beloit Iron Works, Beloit, Wis.; and Max Reuteler, Fairbanks, Morse & Co., Beloit.

90 Attend June Meeting of New England Group

By Merton Hosmer

NINETY members and guests attended the June 14 meeting of the New England Foundrymen's Association, held at the Engineers' Club, Boston.

W. S. Giele, the Walter Giele Co., Lebanon, Pa., provided an interesting topic in "Foundry Materials Handling Equipment." A volume of slides, illustrating the latest types of handling equipment, added to the valuable discussion. As numerous pieces of equipment were reviewed, Mr. Giele emphasized that proper usage is a big factor in obtaining maximum service and efficiency at all times.

A.F.A. Needs Photos Of Chapter Leaders

A.F.A. Headquarters needs pictures of all chapter leaders for use in the AMERICAN FOUNDRYMAN. The cooperation of chapter officers and directors in sending photos to the National Office without delay will be appreciated.

Thanks!

SPEAKERS WANTED
by West Coast Chapters

A.F.A. chapters on the West Coast wish to include on their meeting programs speakers from other sections of the country. Therefore, will those A.F.A. members, who are qualified as speakers and are contemplating visits to the west during the next season, get in touch with the national office?

ROBERT E. KENNEDY,
Secretary, A.F.A.

Central New York Group Votes at Annual Meeting

By E. G. White

CENTRAL New York Chapter's Annual Dinner meeting was held June 16 at the Geneva Country Club, Geneva, N. Y. The principal event was the electioin of officers and directors, so the voting was held immediately after the dinner, with the following results:

Chairman—L. E. Hall, Syracuse Chilled Plow Co., Inc., Syracuse.

Vice-Chairman — E. E. Hook, Dayton Oil Co., Syracuse.

Secretary—E. G. White, Crouse-Hinds Co., Syracuse.

Treasurer—M. H. Hollenbeck, Kennedy Valve Mfg. Co., Elmira, New York.

New Directors are:

J. F. Livingston, Crouse-Hinds Co., Syracuse.

N. H. Boardman, Elmira Foundry Co., Elmira, N. Y.

David Dudgeon, Jr., Utica Radiator Corp., Utica, N. Y.

(Photo courtesy A. J. Heysel, E. J. Woodison Co.)

The Annual Meeting held by the Western New York group will be remembered as an evening of good fellowship. Giving evidence of this are: (front row, left to right) F. E. Bates, Worthington Pump & Machinery Corp.; Chairman Reinhold D. Loesch, Lake Erie Foundry Co.; Elliot Jones, Lumen Bearing Co.; J. Ralph Turner, Queen City Sand & Supply Co.; and Martin O'Brien, Symington-Gould Corp.; (standing, left to right) A. J. Heysel; J. L. Yates, Worthington Pump & Machinery Corp.; Henry F. Sproull, A. P. Green Firebrick Co.; Martin Pohlman, Pohlman Foundry Co., Inc.; Charles Burgess, Union Carbide & Carbon Research Laboratories, Inc.; M. T. Ganzauge, General Railway Signal Co.; and Ray Melville, Hanna Furnace Corp.

Following the voting, the meeting was turned over to Lloyd Wright, U. S. Radiator Corp., Geneva, who introduced Benjamin Averback, metallurgist for the U. S. Radiator Corp. Mr. Averback discussed some of the problems encountered in manufacturing satisfactory magnesium castings and showed slides to illustrate several of the points in question.

New England Group Hears L. H. Rudesill

By M. A. Hosmer

NINETY members and guests attended the regular monthly meeting of the New England Foundrymen's Association held at the Engineer's Club, Boston, on May 10.

L. H. Rudesill, Griffin Wheel Co., Chicago, spoke on "The Selection of Melting Materials Relative to Their Effect Upon the Product." Mr. Rudesill outlined what he called good cupola practice from start to finish. In general, he said, the use of low grade materials was unjustified. However, in some cases low cost materials could be used more economically.

The supervision of cupola operations is very important and standardization of the operations is essential. Improvement of product often comes, not from a new piece of equipment being installed, but because of greater interest and attention given to the whole process at the time the installation of the new equipment is being made. The value of this practice is evident in the finished product.

"Never a dull moment" is a trite but appropriate description of the May Party sponsored by the Chesapeake Chapter.

Reports on Chapter Activities

Officers and representatives of A.F.A. chapter and other foundry groups who report on local activities in this issue, are identified below:

Central New York—E. G. White, Crouse-Hinds Co., Syracuse; Chapter Secretary.

Eastern Canada and Newfoundland—A. E. Cortwright, Robert Mitchell Co., Ltd., St. Laurent, Que.

Michiana—V. C. Bruce, Buckeye Products Co., Elkhart, Ind.; Chapter Chairman.

New England Foundrymen's Assn.—Merton A. Hosmer, Hunt-Spiller Mfg. Corp.; Group Reporter.

Northern California—Richard Vosbrink, Berkeley Pattern Works, Berkeley; Chapter Reporter.

Northern Illinois-Southern Wisconsin—B. L. Baptist, Beloit Iron Works, Beloit; Group Reporter.

Ontario—G. L. White, Westman Publications, Ltd., Toronto; Chapter Secretary.

Texas—H. L. Wren, Beaumont Cement Sales Co., Beaumont, Texas; Chapter Secretary-Treasurer.

Western New York—J. Ralph Turner, Queen City Sand & Supply Co., Buffalo; Chapter Secretary.

REVIEWS OF BOOKS

Pertaining to the Foundry Industry

American Society for Testing Materials, Proceedings of the Forty-Sixth Annual Meeting, Vol. 43, 1943. Dark blue cloth bound, 1349 pages. Published by the American Society for Testing Materials, 260 S. Broad Street, Philadelphia 2, Pa.

This volume contains a summary of the proceedings of the forty-sixth annual meeting, committee reports, and technical papers.

Technical papers of probable interest to foundrymen are "The Strain Aging of Killed Low-Carbon Steel, with Particular Reference to the Effect of Titanium," by George F. Comstock; "Second Progress Report on the Effect of Size of Specimen on Fatigue Strength of Three Types of Steel," by H. F. Moore and D. Morkovin, with an appended "Report of the Research Committee on Fatigue of Metals"; "On the Transition from a Ductile to a Brittle Type of Fracture in Several Low-Alloy Steels," by P. G. Jones; "Structure and Creep Characteristics of Cast Carbon-Molybdenum Steel at 950° F.," by H. E. Montgomery and John Urban; "The Atmospheric Corrosion of Copper," by A. W. Tracy, D. H. Thompson, and John R. Freeman, Jr.; "The Total Immersion Corrosion Test," by W. A. Wesley; "The Technical Cohesive Strength and Other Mechanical Properties of Metals at Low Temperatures," by D. J. McAdam, Jr., and R. W. Mebs; "Interpretation of Creep-Test Data," by P. G. McVetty; "Hyperbolic Sine Chart for Estimating Working Stresses of Alloys at Elevated Temperatures," by A. Nadai and P. G. McVetty; and "The Effect of Overstressing and Understressing in Fatigue," by J. B. Kommers.

Foundrymen will also want to read the *Symposium on the Significance of the Hardness Test of Metals in Relation to Design* which consists of the following papers: "Some Notes on the Indentation Hardness Test," by J. M. Lessells; "Present Types of Hardness Tests," by S. R. Williams, and "Fundamentals of Hardness Testings," by S. L. Hoyt, followed by a general discussion.

The Technology of Magnesium and Its Alloys. Compiled by Dr.-Ing. E. h. Adolf Beck in 1939. Translated from the German by the technical staff of F. A. Hughes & Co., Limited, and Magnesium Elektron Limited in 1940. Red cloth bound, 512 pages. Sole license from the Alien Property Custodian to import this English translation is held by Basic Magnesium, Incorporated. The book is distributed by and may be obtained from Brentano's, 586 Fifth Avenue, New York, N. Y. Price $10.00 per copy.

Included in the book are chapters on raw materials and production; physical properties of magnesium single crystals and their importance in the polycrystalline material; metallography of magnesium and its alloys; physical properties; mechanical properties; chemical behavior, corrosion, and surface protection; melting and casting; techniques of die casting; the technique of pressure die casting; technique of extrusion; technique of forging; technique of rolling; machining; principles of design, correct workshop practice, practical examples; magnesium as an alloying element; magnesium in pyrotechnics and thermo-chemistry; chemical analysis of magnesium and its alloys; and summary of patent specifications covering the production, fabrication, and utilization of magnesium and magnesium alloys.

Emphasis is placed on German developments throughout all sections of the book except the summary of patent specifications. In spite of this the author succeeded in compiling a vast amount of technical information and data which had not been published previously.

All references to alloys by German specification designations in the original text were changed to the corresponding D.T.D. specification designation in the British translation. Whenever British practice or findings were markedly different from those described in the original text, the translators have inserted footnotes calling the reader's attention to this fact. The translation is in readable English and the book should be of considerable value to those engaged in the technical phases of the manufacture of magnesium products.

S.A.E. Studies Foundry Control

THE War Engineering Board, Society of Automotive Engineers, headquarters at 808 New Center Building, Detroit 2, Mich., has made a study of process control in the various branches of the foundry industry. The Board has issued process control procedures for steel castings, gray iron castings and malleable castings, and also a resume of the procedures for the impregnation of aluminum and magnesium castings. Other committees of the Board now are studying process control procedures for the aluminum and magnesium divisions of the industry. Copies of the control procedures may be obtained from the S.A.E. War Engineering Board at the above address, at a nominal cost.

Abstracts

NOTE: The following references to articles dealing with the many phases of the foundry industry, have been prepared by the staff of *American Foundryman*, from current technical and trade publications.

When copies of the complete articles are desired, photostat copies may be obtained from the Engineering Societies Library, 29 W. 39th Street, New York, N. Y.

Accident Prevention

MAGNESIUM RUN-OUTS. *(See Magnesium.)*

Aircraft Castings

MAGNESIUM. *(See Magnesium.)*

Aluminum

FOUNDRY CONTROL. *"Maintaining Production Standards Through the Principles of Foundry Control,"* Robert E. Ward, NASSAU, Feb., 1944, pp. 3-9.

The author discusses the importance of foundry control in producing highly stressed castings and describes the control systems in operation in his foundry, where it is necessary to utilize much inexperienced help and where inexperienced help must be trained within relatively short periods of time.

Phases of foundry control discussed include proper sampling, analyses and testing of incoming sand, sand additions, and metals; identification of materials in storage; preparation of sand; testing of molds and cores; melting and pouring practice; handling of scrap metal; heat treatment; routine temperature checking of furnaces, ovens, and pyrometers; chemical treatment baths; and chemical and physical testing.

SUBMICROSCOPIC STRUCTURES. *(See Electron Microscope.)*

Cast Iron

HIGH STRENGTH. *(See Metallurgy.)*

STRESS CORROSION. *"Stress Corrosion of Cast Irons,"* R. F. Hehemann, D. A. Shepard, and L. Thomassen, METALS AND ALLOYS, vol. 19, no. 5, May, 1944, pp. 1141-1144.

A description of a series of tests performed to study the resistance of cast irons to stress corrosion and the conclusions drawn from these experiments.

Results indicated that malleable cast irons have very good resistance to stress corrosion, while the more corrosion-resistant austenitic cast irons have poor resistance to stress corrosion. Gray cast iron was found more resistant to stress corrosion than austenitic cast iron, but not so resistant as malleable cast iron.

Centrifugal Casting

ADVANCED METHODS. *(See Metallurgy.)*

METHODS. *"Centrifugal Casting Methods,"* Nathan Janco, THE IRON AGE, vol. 153, no. 13, March 30, 1944, pp. 42-45.

A discussion of types of centrifugal castings, molds, pouring procedures, spinning speeds, and methods of eliminating defects.

Control

ALUMINUM FOUNDRY. *(See Aluminum.)*

Converter Steel

DEOXIDATION. *(See Steel.)*

Corrosion

STRESS. *(See Cast Iron.)*

Defects

MAGNESIUM CASTINGS. *(See Magnesium.)*

Die Castings

PRESSURE MOLDED. *(See Metallurgy.)*

Drying

INFRA-RED RAY. *"Drying Impregnated Castings with Infra-Red Rays,"* S. H. Brams, THE IRON AGE, vol. 152, no. 24, Dec. 9, 1943, p. 64.

A brief article describing the drying of a water glass solution used to impregnate porous magnesium and aluminum-base castings by means of infra-red rays.

Electron Microscope

ALUMINUM-BASE ALLOYS. *"Application of Electron Microscope to Study of Aluminum Alloys,"* F. Keller and A. H. Geisler, Technical Publication No. 1700, METALS TECHNOLOGY, vol. 11, no. 3, April, 1944, 17 pages.

The authors have compared methods of making replicas, and have described methods of producing structureless oxide films and their usefulness in disclosing submicroscopic detail. Thirteen figures illustrate the results obtained by various methods.

Fluoroscopy

INDUSTRIAL APPLICATION. *"Industrial Fluoroscopy,"* R. W. Mayer, STEEL, vol. 114, no. 22, May 29, 1944, pp. 105, 108.

The author refers briefly to the developments which have made fluoroscopic inspection of castings a possibility. He describes the desirable characteristics of a fluoroscopic unit which is to be used for routine inspection, gives something of the necessary qualifications of persons who are to do fluoroscopic inspection, and describes various factors which affect the efficiency with which the operator works.

Fluxing

MAGNESIUM-BASE ALLOYS. *(See Magnesium.)*

Heat Treatment

ISOTHERMAL TRANSFORMATION. *(See Steel.)*

Impact Tests

NOTCHED BAR. *"The Notched-Bar Impact Test,"* John H. Hollomon, Technical Publication No. 1667, METALS TECHNOLOGY, vol. 11 no. 3, April, 1944, 25 pages.

A study of the behavior of steel in notched-bar impact tests and an interpretation of brittle failure of notched-bar specimens of some steels. The author discusses the distribution of stresses in notched bars; the relation between tensile and notched-bar impact properties; the effect of variables such as radius of notch, impact velocity, and width of bar; and the significance and use of notched-bar test results.

Mr. Hollomon's paper is followed by an appendix by Dr. C. Zener entitled "Calculation of Transverse Stress at Base of Notch," and an appendix entitled "Relation Between Velocity and Strain Rate in Bending Test."

Impregnation

INFRA-RED RAY DRYING. *(See Drying.)*

MAGNESIUM CASTINGS. *"A System for the Impregnation and Polymerization of Magnesium Alloy Castings,"* INDUSTRIAL HEATING, vol. 11, no. 2, Feb., 1944, pp. 220, 222.

This article describes some of the details of an autoclave vacuum process for impregnating porous magnesium castings with tung oil.

MAGNESIUM CASTINGS. *"Magnesium Castings Impregnated by New Method,"* S. H. Brams, THE IRON AGE, vol. 152, no. 20, Nov. 11, 1943, pp. 57-59.

The author describes a direct pressure process of impregnating porous magnesium castings with tung oil, and compares this process with the autoclave vacuum impregnation process.

POROUS CASTINGS. *"Reclamation of Porous Castings,"* THE METAL INDUSTRY, vol. 63, no. 9, Aug. 27, 1943, p. 136.

This article describes a process in which porous castings are impregnated with a plastic material under pressure. Following impregnation, heat treatment changes the plastic to a stabilized, highly-resistant filling which seals the pores against leakage.

Inspection

FLUOROSCOPY. *"Fluoroscopy and Radiography Combined in New Unit,"* Robert Taylor, THE IRON AGE, vol. 153, no. 16, April 20, 1944, pp. 76-78.

The author describes an x-ray unit which is suitable for either radiographic or quantity fluoroscopic inspection of die castings, plastic parts, or small castings.

Lost Wax Process

PRECISION CASTING. *(See Precision Casting.)*

Magnesium

AIRCRAFT CASTINGS. *"The Sand Casting of a Typical Aircraft Component in a Magnesium Alloy,"* G. Goddard, MAGNESIUM REVIEW AND ABSTRACTS, vol. 4, no. 1, Jan., 1944, pp. 19-26.

The author describes two types of investigations which were carried out in order to eliminate defects which occurred in an aircraft gasoline tank cover magnesium-base casting.

FLUXES. *"The Use of Fluxes in the Melting, Refining and Casting of Magnesium-Base Alloys,"* E. F. Emley, MAGNESIUM REVIEW AND ABSTRACTS, vol. 4, no. 1, Jan., 1944, pp. 3-13.

A discussion of the behavior of magnesium when heated without fluxing; types of fluxes used for magnesium-base alloys; methods of fluxing during melting, refining, and pouring; treatment of the metal remaining in the pot after pouring; modifications of standard fluxing procedures; proper storage of fluxes; and the causes of flux inclusions in castings.

RECLAMATION. *(See Impregnation.)*

RUN-OUTS. *"Preventive Measures in Respect of Run-Outs of Metal in Magnesium Foundries,"* S. B. Hirst, MAGNESIUM REVIEW AND ABSTRACTS, vol. 4, no. 1, Jan., 1944, pp. 14-18.

The two principal preventive measures for avoiding run-outs in magnesium foundries are discussed: (1) the inspection and maintenance of crucibles, and (2) the design and maintenance of furnaces. Since magnesium is so reactive at furnace temperatures, every effort should be made to avoid the occurrence of a run-out. If, in spite of all efforts, a run-out occurs, the steps to be taken to minimize possible damage are described by the author.

SURFACE TREATMENTS. *(See Protective Coatings.)*

Malleable Iron

STRESS CORROSION. *(See Cast Iron.)*

Materials Handling

ROPE. *"Rope-Ology,"* E. L. Cady, MECHANICAL HANDLING, vol. 30, no. 10, Oct., 1943, pp. 429-433, 445; no. 11, Nov., 1943, pp. 495-496.

In this article, which was taken from *Mill & Factory*, the author discusses the applications of ropes in materials handling. He describes how ropes are made, the types of loads to which they are subjected, explains a method for determining the strength of rope, compares war emergency sisal ropes with best manilla ropes, compares new rope with used rope, tells how to estimate the value of ropes, and describes various types of damage to ropes. The second half of the article gives hints on prolonging the useful life of ropes.

Metallography

ALUMINUM-BASE ALLOYS. *(See Electron Microscope.)*

FOUNDRY IMPROVEMENTS. *"Improved Castings From Better Foundry Metallurgy,"* METAL PROGRESS, vol. 45, no. 4, April, 1944, pp. 666-674.

A group of papers presented at the last annual A.S.M. convention.

Improvements in steel foundry methods are discussed in "Advanced Melting Methods," by G. A. Lillieqvist, and "High Strength, High Ductility Cast Steels," by Carl F. Joseph. G. L. Richter, in "High Strength Cast Iron," discusses the properties and applications of high strength cast irons. Chas. K. Donoho, in "Centrifugal Casting," discusses the casting methods, molds, metals cast, and applications for centrifuging, semi-centrifugal casting, and true centrifugal casting. The production of pressure die castings of sufficient soundness for structurally responsible parts is discussed by David Basch.

All of the developments discussed in the foregoing papers were made possible by metallurgical studies of foundry practice.

Non-Destructive Inspection

FLUOROSCOPY. *(See Fluoroscopy.)*

Precision Casting

PROCESS. *"Precision-Casting Process Saves Machining Operations,"* PRODUCT ENGINEERING, vol. 15, no. 5, May, 1944, pp. 293-298.

A modern adaptation of the lost wax method of casting to the production of small or intricate parts requiring close dimensional tolerances.

Protective Coatings

MAGNESIUM-BASE ALLOYS. *"Surface Treatments for Magnesium,"* Emmette R. Holman and James P. ApRoberts, METALS AND ALLOYS, vol. 18, no. 5, Nov., 1943, pp. 1068-1074; no, 6, Dec., 1943, pp. 1331-1334.

This article describes various methods of cleaning magnesium-base alloy parts and applying protective coatings.

Part I of the article describes precleaning, cleaning, and pickling processes, and two chemical surface treatments—the "chrome pickle" and the "acid dichromate" treatment.

Part II of the article covers the "alkaline dichromate" treatment, "galvanic anodizing" treatment, "anodic" treatment, nickel and silver plating, and organic coatings.

Quality Control

STATISTICAL METHODS. *"Statistical Methods of Quality Control,"* Craig Stirewalt and Jean Bordeaux, THE IRON AGE, vol. 153, no. 19, May 11, 1944, pp. 56-60.

Statistical methods adapted to the identification and elimination from repetitive processes the causes of most rejections.

Radiography

FLUOROSCOPIC INSPECTION. *(See Inspection.)*

Reclamation

MAGNESIUM-BASE CASTINGS. *(See Impregnation.)*

Sand

METHODS OF ADDING CLAY. *"Slip Coated Synthetic Foundry Sand,"* Felix Singer, FOUNDRY TRADE JOURNAL, vol. 72, no. 1441, March 30, 1944, pp. 261-264; no. 1442, April 6, 1944, pp. 285-288.

Attempts to discover a suitable substitute for bentonite led the author to experiment with various ways of adding clay to foundry sand mixtures. He tried adding the clay in three conditions: (1) as a dry powder, to be mixed with the dry sand grains before moisture was added; (2) in a plastic condition, to be added to either wet or dry sand grains and kneaded and mixed until each sand grain was covered with a thin film (theoretically); and (3) in the form of an aqueous suspension, to be added to and mixed with dry sand grains until all particles of sand were covered with a thin film of the clay material.

Of the three ways of adding clay, the author found the latter method most effective. If the entire clay content of a mixture was added in the form of a simple water suspension, the moisture content of the sand mixture was too great. Therefore the author tried adding deflocculants to the water suspension to form a colloidal slip like that used by the ceramist. This permitted the complete coverage of each sand grain within a minimum of mixing time without introducing an excess of moisture.

Sand rammed from a mixture thus bonded gave very high dry strengths but rather low green strengths, probably the result of lack of cohesion between the deflocculated clay particles.

Addition of a flocculant after the sand grains were adequately coated with a clay film restored the green strength or even raised it above the values ordinarily obtained following prolonged mixing of raw clay mixtures. Sands bonded with raw clay also showed an increase in green strength following the addition of flocculants.

An essential part of all the mixing was the use of a Beken Duplex type of mixture to avoid a grinding or crushing action, which would have increased the sand surface area during mixing.

Sponge Iron

POSTWAR USES. *"Sponge Iron Has Definite Place in Postwar Picture,"* Walter A. Janssen, STEEL, vol. 114, no. 21, May 26, 1944, pp. 94, 145-148.

Sponge iron is a relatively pure virgin iron formed by converting or reducing finely divided iron ore to metallic iron. The process is carried out without melting. Because of the high concentrations of alloying elements which have accumulated in our steel scrap, it has been suggested that sponge iron would be an excellent material to dilute the alloy concentrations after the war.

The author summarizes the history of sponge iron, describes the present development of installations in Sweden where considerable progress has been made, and discusses the advantages and disadvantages of its production.

Steel

CONVERTER. *"Proper Deoxidation Practice Improves Quality of Bessemer Converter Steel,"* INDUSTRIAL HEATING, vol. 11, no. 3, March, 1944, pp. 406, 408.

This article is a summary of a paper presented by E. C. Wright at the February 23 meeting of the American Institute of Mining and Metallurgical Engineers, in New York, N. Y.

It discusses a recent development whereby Bessemer converter steel is deoxidized by additions of hot iron containing approximately 4 per cent carbon, as well as some manganese and silicon.

The conclusion of the paper compares "killed" converter steel to similar grades of open hearth steel, showing that "killed" converter steel is equal to or superior to the corresponding grades of open hearth steel with respect to many properties.

ISOTHERMAL TRANSFORMATION. *"Interpretation of Isothermal Transformation Diagrams for Steel,"* INDUSTRIAL HEATING, vol. 11, no. 4, April, 1944, pp. 525-526, 528, 530, 532, 534, 536; no. 5, May, 1944, pp. 693-696, 698, 700, 702, 714.

This article was prepared from "An Atlas of Isothermal Transformation Diagrams," which is a compilation of information on the isothermal diagrams for a number of typical steels, brought together by the United States Steel Corporation.

In a simple manner this article describes how such curves are developed and their significance, and reproduces many of the isothermal transformation diagrams.

Steel

MELTING METHODS. *(See Metallurgy.)*

HIGH STRENGTH, HIGH DUCTILITY CASTINGS. *(See Metallurgy.)*

NOTCHED-BAR IMPACT TESTS. *(See Impact Tests.)*

X-ray

FLUOROSCOPY. *(See Fluoroscopy.)*

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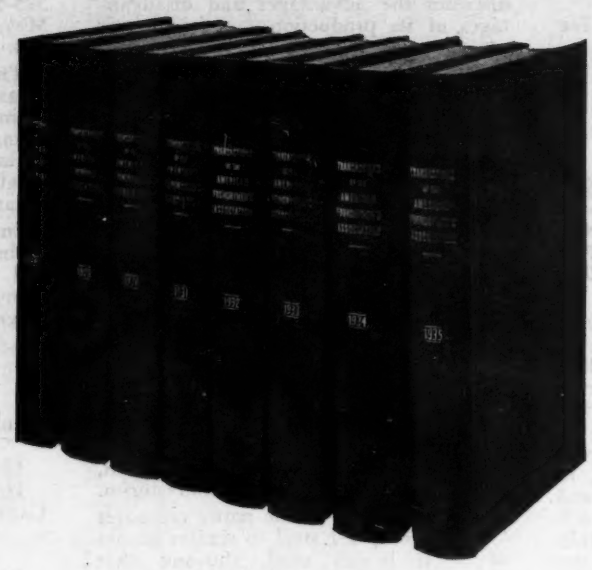

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